

CLAIMS:

1. A medical instrument comprising:

a guide wire that is inserted at one end through a vascular portion narrowed by deposits and extended at the other end out of a patient's body;

a rotating cutter that is rotatably and slidably guided over said guide wire and is driven to cut away the deposits in said narrowed vascular portion;

a hollow drive shaft that is operatively connected to said rotating cutter and through which said guide wire is inserted;

a fixed sheath having inserted therein said drive shaft; and

a controller having a drive assembly for rotating said drive shaft;

wherein said rotating cutter is driven to perform intravascular treatment to establish patency of said narrowed vascular portion or to distend said vascular portion;

characterized in that:

a secondary treatment rotating cutter, whose cutting surface has an outside diameter larger than the maximum diameter of the cutting surface of said rotating cutter (an initial treatment rotating cutter), is disposed on that part of said guide wire extending out of the patient's body; and

in the case of further distending said narrowed vascular portion after cutting treatment of said narrowed vascular portion by said initial treatment rotating cutter, said initial treatment rotating cutter is once pulled out of the patient's body along said guide wire, together with said drive shaft and said fixed sheath, then said secondary treatment rotating cutter is coupled on said guide wire to said initial treatment rotating cutter to form a one-piece cutter assembly of enlarged outside diameter, and said cutter assembly (unit cutter) is inserted again into the patient's body to perform further distending treatment of said narrowed vascular portion.

2. The medical instrument of claim 1, characterized in that said secondary treatment rotating cutter is united with said initial treatment rotating cutter by fit-lock or press-fit means.

3. The medical instrument of claim 1, characterized in that the curved cutting surface of said initial treatment rotating cutter is covered with said secondary treatment rotating cutter through plastic deformation of the latter in conformity to the the outer peripheral surface of the former.

4. The medical instrument of claim 1, characterized in that said secondary treatment rotating cutter is disposed in advance coaxially with or in proximity to said drive shaft.
5. The medical instrument of any one of claims 1 to 4, characterized in that said secondary treatment rotating cutter is set on said initial treatment rotating cutter by a jig disposed in advance coaxially with or in proximity to said drive shaft.
6. The medical instrument of claim 5, characterized in that said jig has a one-hand operated, squeeze-type lever mechanism that utilizes a force-multiplying mechanism by a lever or cam.
7. The medical instrument of any one of claims 1 to 5, characterized in that said initial treatment rotating cutter and said secondary treatment rotating cutter have their cutting surfaces formed by grooves or cutting edges made in their outer peripheral surfaces.
8. The medical instrument of claim 1, characterized in that said controller has a mechanism for pushing said initial treatment rotating cutter out forwardly from a distal end of said fixed sheath toward the patient side and a mechanism for retracting said initial treatment rotating cutter in a reverse direction, and that these mechanisms are actuated by a squeeze-type operating lever provided with an auto-return mechanism and a position retaining mechanism.
9. The medical instrument of claim 1 or 8, characterized in that said controller is provided with a vibrating mechanism for reciprocating said initial treatment rotating cutter along said guide wire.
10. The medical instrument of claim 1, 8, or 9, characterized in that a drive assembly in said controller for rotating said drive shaft is provided with a motor having a hollow rotary shaft which permits the insertion therethrough of said drive shaft.
11. The medical instrument of claim 1, 8, 9, or 10, characterized in that said controller has a drive shaft chucking mechanism and a soft sheath attach/detach mechanism.